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MANPOWER AND TRAINING NEEDS SURVEY IN TELECOMMUNICATIONS

FOR

UGANDA POSTS AND TELECOMMUNICATIONS CORPORATION

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ABREVIATIONS

EAC	East Africa Community
UPTC	Uganda Posts and Telecommunications Corporation
EXTELCOMS	East Africa External Telecommunications Corporation
EAPTC	East Africa Posts and Telecommunication Corporation
ECA	Economic Commission for Africa
UNDP	United Nations Development Programme
EEC	European Economic Commission
IDA	International Development Association
ITU	International Telecommunication Union
PANAFTEL	Pan-African Telecommunications Network
INTELSAT	International Telecommunications Satellite Organization
VHF	Very High Frequency, 30-300 MHZ
UHF	Ultra-High Frequency, 300-3000 MHZ

I. INTRODUCTION

1. During the second half of 1987, the United Nations Economic Commission for Africa (UN/ECA) was asked to conduct a Manpower and Training Needs Survey for the Uganda Posts and Telecommunications Corporation.

2. The survey was conducted in December 1987 with a visit to Uganda by Mr. Baxter, Telecommunications expert. The expert met with all senior management staff of the Telecommunications Department in the Corporation and visited the Nakawa Posts and Telecommunications School.

3. The expert would like to extend his gratitude to the entire management of UPTC for their support and co-operation during the duration of the survey.

1.1 Terms of Reference of the Mission

4. The following were the Terms of Reference for the survey:

(a) To determine the basic and medium-level training requirements of the Uganda Posts and Telecommunications Corporation (UPTC);

(b) To assess the performance and capability of UPTC National Training School and to make recommendations for expansion and/or upgrading;

(c) To evaluate the type and level of training to be developed at the National School to meet the identified needs in accordance with UPTC development policies; and

(d) To identify reasons for difficulties, slow-down and the bottlenecks of the National School and recommend appropriate action to be taken to overcome identified problems.

2. BACKGROUND

5. The Republic of Uganda is located in the central equatorial part of the African continent, and is bordered by Sudan in the North, Tanzania in the South, Kenya in the East and Zaire in the West. The size of Uganda is about 240,000 square kilometres, with a population of 14,325,000 as of 1984, growing at a rate of 3.2 per cent a year. Most parts of the territory consist of plateaux with an average height above sea level of 1,220 metres. The climate is mild and blessed with rainfall adequate for agricultural products.

6. With respect to economics, agriculture and mining play a principal role in the Ugandan economy. The main cash products of agriculture are coffee, cotton, tea and sugar and the principal mineral resources are copper, cobalt, sulphur and limestone.

7. The table below shows Uganda's GNP in recent years.

	1982	1983	1984
Population (in Thousands)	13,451	13,881	14,325
GNP (in million $)	3,240	3,460	-
GNP per Head (in $)	240	249	-

The 1985/86 statistics were not available.

Note: Source IMF.

3. PRESENTATION OF THE SURVEY

8. The purpose of the survey was to obtain general information on the existing situation in the Uganda Posts and Telecommunications Corporation, with emphasis on the Telecommunications Sector, including the identification of the principal problems and constraints to the development of telecommunications in Uganda. Based upon the findings, recommendations were made for possible courses of action.

9. The recommendations made should ensure in the long term the supply of necessary specialized managerial, technical and operational skilled staff for self-sustained development and efficient operations of the Telecommunications Department of UPTC.

10. The manpower forecasting methodology was based on the macro approach which specifies broadly the manpower demand and supply needs in terms of organization structure, level of staff and specialization and analyses the flow of staff within the Telecommunications Department on a yearly basis. This method was adopted because of the time factor vis-a-vis the size of the Corporation rather than looking at each functionary unit with set performance standards around which the staff requirements are built. As far as possible, the survey was conducted in accordance with the terms of reference.

11. The Uganda Posts and Telecommunications Corporation has for some time been undergoing a process of change due to political and economic problems which are well known as well as technological development. The fact that UPTC is trying to switch from an administrative type of operation to one run more along business lines is having a major impact on the management of human resources. The foundations of this new management approach have yet to be developed. This survey was based on the personnel situation as of December 1987 and UPTC rehabilitation and Development Programme 1985-1990.

12. Some of the parameters and coefficients used for evaluation purposes are likely to undergo significant change, reflecting strategic options that were not foreseeable during the survey. To facilitate the transformation of UPTC's training and manpower development policy, the parameters used should be regularly updated and any variation in the results of this report should be observed.

13. Remuneration is decisive for proper staff motivation and efficiency. This problem is not dealt with in this survey, because it calls for a knowledge of the social and economic environment of Uganda and the sub-region, and this can only be acquired through specific fact-finding missions.

14. As a preliminary it should be stressed that training efforts are meaningless unless accompanied by a sharp increase in staff productivity. Effectiveness of training must be the first concern. Training is not an end in itself, but it is one of a number of closely related personnel development actions which, when taken together, can produce the desired improvement in job performance.

15. The report is subdivided into four main parts: an overall description of UPTC's existing facilities, activities and qualities of service; an analysis of the Telecommunications Department's personnel policies and classification followed by UPTC's development programme, manpower development and training policy. The last part of the report concluds with a summary and recommendations which can be designed as bankable projects.

4. SUMMARY AND RECOMMENDATIONS

4.1 Summary

16. It was observed that the Telecommunications Department of UPTC is inadequately staffed, especially in the local network system. Regular training activity came to stop for more than two years (1983 to mid-1985). Some of the available training instructors were deployed in the field. Most of these instructors are being brought back and training has begun at the school but only at the basic level. Medium and advanced training does not exist. Workers' morale is also at the lowest ebb because of the lack of motivation and incentives. There has not been any promotion for about 10 years, most of the higher level posts have been filled by appointments, which is a great obstacle to staff motivation. Since most of the high level posts are filled by appointments, the turn over rate has been very high. The present qualified staff who are required to cope with day-to-day engineering and operations problems and the planning functions can be described as the bare minimum. The above general situation points to the weaknesses in UPTC management. The organization structure of the department is currently being reviewed to improve the situation.

4.2 Recommendations

R1

17. It is recommended that the functions of training presently under the personnel and training department be revised with special emphasis on manpower development in the technical, administrative and finance sectors. A realistic scheme of service should be drawn up with a view to providing better career prospects and service conditions so as to increase productivity and attract recruits into the system.

R2

18. The rehabilitation and up-grading of the Nakawa Posts and Telecommunications Training School to the level where it would be capable of offering medium level training in telecommunications should be given high priority. The school should be fully equipped with model test gear and start basic research and development (R & D) programmes.

R3

19. A training budget line should be established and where necessary requests made for assistance from relevant international bodies for certain specialized training.

R4

20. Emphasis should be placed on training for maintenance, quality of service, management, commercial aspects and information for management.

R5

21. To begin with it is recommended that specialized training be organized on a modular basis for basic and medium level training.

R6

22. All possible efforts should be made to assign employees to posts for which they have been trained.

R7

23. UPTC should establish recruitment procedures and qualifications for all levels.

R8

24. Significant efforts should be made for the improvement of staff productivity. This would require that careful attention be given to improving incentives and motivations.

R9

25. The training of trainers deserves priority. Prospective trainers should be selected from within and trained to replace the experts that will be leaving the service.

R10

26. With the rapid advances in technology, medium and advanced level training is vital. Staff should be exposed to these changes by constant training outside the country through fellowships in these areas, until such training facilities become available at UPTC's training school and/or AFRALTL. Serious management training should also be pursued at this level.

5. THE UGANDA POSTS AND TELECOMMUNICATIONS CORPORATION

27. After the fall of the East Africa Posts and Telecommunications Corporation (EAPTC) and the East Africa External Telecommunications Corporation (EXTELCOMS) of the East Africa Community (EAC), UPTC was established in 1977 by presidential decree number 15 to take over in Uganda the services that were proviced by EAC. The decree gave UPTC a caretaker role in the framework of the EAPTC's Act of 1967. Under this interim arrangement, UPTC operated under the Ministry of Transport and Communications and was responsible for operating all postal and telecommunications services in the country.

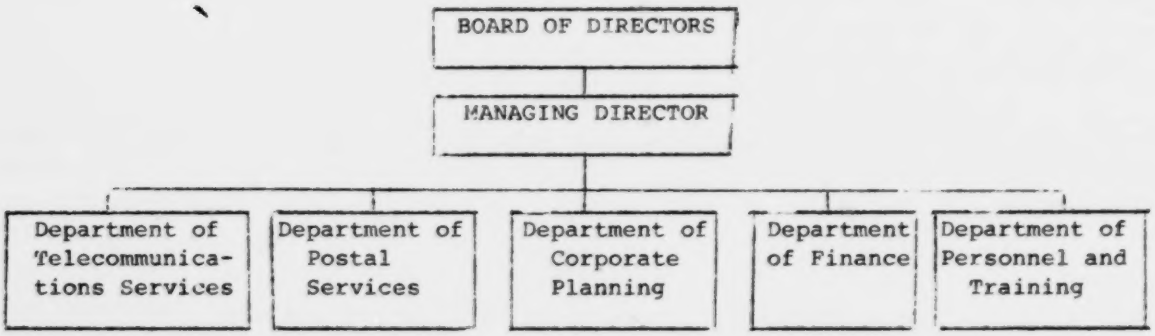
28. A legal framework was established by UPTC Act on 1 December 1984. The Act replaced the former Caretaker Corporation which was established in 1977.

29. Even though UPTC is still responsible for operating all domestic and international telecommunications services, other agencies such as the Military, Police, Civil Aviation and Railways operates limited telecommunication facilities to meet their specialized requirements.

30. UPTC is also responsible for postal services including money orders and acts as agent for the Government Post Office Savings Bank (POSB).

31. Radio and television broadcasting services are provided by the Ministry of Information and Broadcasting.

32. UPTC's main departmental organization chart is shown below. It reflects the five departments which are responsible for telecommunications services, postal services, planning, finance and accounting, and personnel and training. Operations and maintenance are partly decentralized on a regional basis, see Annex I.



33. UPTC is governed by a Board of Directors; the members are appointed for a three year period by the Minister of Posts and Telecommunications who is responsible for general guidance and control of UPTC. The Board consists of a Chairman, UPTC's Managing Director and seven other members. Subject to ministerial approval, the Board may determine tariffs, salaries, wages and other conditions of employment and the organization of UPTC. Ministerial approval is also required for UPTC's annual operating and investment budgets. The Act of 1984 authorizes UPTC to borrow from domestic and foreign sources with the prior approval of the Minister of Finance.

34. The Department of Telecommunications Services is headed by a Director. The Department deals with construction, planning, traffic, operations and maintenance and workshop, divided into eight regional zones. Training is managed by the Personnel Department.

6. DESCRIPTION OF THE TELECOMMUNICATIONS SYSTEM

6.1 Quality of service

35. During the last few years, UPTC has managed to halt the decline in the quality of telephone service in the country and to improve it in many areas. With the introduction of new digital exchanges in Kampala and Masaka in mid-1985, there has been rehabilitation of the Jinja exchanges and installation of new transmission lines. Service quality has improved remarkably in the main zones of Kampala, Jinja and Masaka. However, calls to the western and northern regions experience long delays of several hours or even days. Furthermore, while the subscriber direct dialling has improved, the operator assisted services are poor mainly due to inadequate staffing and training. Operator answering times average 3 minutes for national and over 6 minutes for international calls in Kampala. In addition, about 8,000 DELs are out of service due to faults in cable network, 63 per cent in subscriber facilities and 4,500 or 13 per cent DELs are temporarily out of service due to non-payment of bills.

6.2 Current telephone services

(a) Telephone density

36. As of 31 December 1986, Uganda had an installed capacity of 57,700 telephone exchange lines, 26,799 connected subscriber lines (DELS), 60,286 telephones, and a telephone density of 0.2 DELs per 100 population. The service is heavily concentrated in the main towns. Kampala has 61 per cent of the DELs but only 4 per cent of the population. Kampala has telephone density of 3.0 and district headquarters 1.1. This is over 100 times the average for the rest of the country 0.01. The majority of Uganda's population has no access to telephone service.

(b) Category of subscribers

37. In Kampala about 70 per cent of DELs are connected to business and government subscribers and 30 per cent to residential subscribers. Most of the former are in the communications-intensive sectors of the economy. Mainly wholesale and retail trade make up 29 per cent of DELs, services 21 per cent, and government administration 12 per cent. Detailed summary of telephone distribution is given in Table 6.1 below

Table 6.1

Summary of telephone distribution

	Kampala (including Entebbe) %	Jinja %
Residences	30	32
Business (retail and wholesale)	29	22
Services:		
Banking (including insurance)	2	4
Communicaions and transport	3	2
Education (including state)	5	4
Professionals	4	4
Water and electricity	4	1
Other services	3	5
Sub-total:	21	20
Government administration	12	14
(including defense and police)	12	14
Industry	5	10
Others	3	3
Sub-total	20	27
Number of subscribers	15,700	3,400
Per cent of total DELs	61	13

(c) Waiting applicants

38. At the end of 1984, UPTC had about 20,000 registered applications for new telephone lines. The official demands, however, may not reflect the actual demand which has been depressed due to the economic disruption. Furthermore, there is probably a large unregistered demand which will emerge only when new connections and improved service are perceived by the public to be available. The present picture has not changed much.

6.3 Existing facilities

(a) Exchanges

39. As of 31 December 1986 UPTC had 21 telephone exchanges with an installed capacity of 57,700 lines, with 26,799 lines in service, automatic exchanges account for 86 per cent of the installed capacity. These are mostly either crossbar, commissioned in the early 70's or digital, commissioned mid-1985.

40. The existing telephone exchanges are summarized in Annex 2. Annex 2 also gives basic telephone service statistics, for the 1975 - 1985 period.

(b) Transmission system

41. A microwave system links Kampala, Jinja and Nairobi as part of the Pan-African Telecommunications (PANAFTEL) network and carries domestic and international traffic to Kenya and Tanzania. The domestic trunk network consists of microwave links between Kampala and Entebbe, and between Kampala, Masaka and Mbarara, and of VHF/UHF links and overhead lines with carrier equipment in the rest of the country. Many of the VHF/UHF links are being rehabilitated. International services are provided through a standard A INTELSAT earth station commissioned in 1981.

(c) Local Network

42. Under the rehablitation programme a feasibility study is being conducted by NEC of Japan. The aim of the study is to evaluate the local networks of Kampala, Jinja and Entebbe to determine whether they can be repaired or replaced. These networks are either outdated or were damaged during the 1978/79 war. The study is being funded by IDA Credits.

6.4 Management of the Telecommunications Department

43. Management is undoubtedly the weak point in the Telecommunications Department, at any event more so than on the technical side.

44. The structure is not always clearly defined and disproportionate outside influence is often exerted. The staff is not always conscious of its individual duties and responsibilities.

45. Management tools such as planning, programming, job descriptions, organization charts, manning tables and activity reports are either embryonic or non-existent.

46. Even though the Department has engineering planning and operation sections, they are usually not in full control of the services' parameters, such as adequate knowledge of their "market" in terms of quantitative and qualitative requirements. These shortcomings are causing serious problems for UPTC. Efforts are now being made to re-organize the entire department but this is still far from realization.

6.5 Management approach

47. Success in any business requires constant research and efficiency, which means the most effective harnessing of human, financial and technical resources.

48. Although modern management methods such as planning, programming and management control are essential, they are not the only conditions for success and must be accompanied by financial and psychological incentives. Management methods must be based on achievable planning objectives and resources.

49. UPTC must establish explicit goals that are understood and accepted by the staff. Planning and control are essential and must focus more on results as compared to regulations. To achieve these goals would require the development of telecommunications master plans, job descriptions, proper organization, manning tables, development indicators, activity reports, etc.

50. Another important area is staff remuneration. It must be brought into line with that of comparable national organizations. The internal promotion system based on efficiency rather than seniority must be reactivated.

51. It is equally important that satisfactory working conditions be established. The delegation of duties and responsibilities should as far as possible be decentralized and the creation of job satisfaction must be a priority if each individual is required to give his best.

52. The above approach would certainly bring about a change in attitutde geared towards satisfying subscribers and staff alike. Room for individual improvement and progress must be promoted in the Telecommunications Department.

53. As a start, UPTC may wish to assign priority to the improvement of the quality service offered to users, self-financing in the medium-term and opening up of the rural areas.

54. Improvement of the quality of service offered to users must be given high priority. Subscriber satisfaction is measured by the quality of service. This is determined by a set of indicators relating to the call completion rate, the quality of communication, repair faults, etc. These indicators must be periodically and systematically observed and evaluated in accordance with pre-set criteria. The same applies to traffic. It is the pre-requisite for the qualitative development of telecommunications.

55. From the technical side, some of the exchanges have already been digitalized and others are expected to be modernized. The local networks are in the process of being rehabilitated. The next stage would be to replace the old urban centres in the large town by new ones, again using the same technology. Some of this old equipment should also be used for extending telecommunication services to the rural areas.

56. Gradual digitilization of the network is inevitable because the digitilization of one function (e.g. switching) creates an environment which is favourable to the digitilization of others such as transmission: the incorporation of digital techniques avoids the sort of analogue - digital conversion which is essential in hybrid networks.

57. Even though extending telecommunications services to the rural areas at this time raises the problem of economic viability, it should be encouraged as far as possible.

58. Technically speaking, the infrastructures are gradually being rehabilitated or developed; the problem will be to operate them properly.

59. With regard to operation, UPTC has began to computerize its system, but mostly towards management. It should also be extended to technical operations.

6.6 Internaitonl cooperation

60. Uganda receives international assistance from the World Bank which is one of its financial partners. On a bilateral basis, the Government also receives aid from friendly Western countries, such as France, Japan, etc. Assistance is also given to the Government by ECA, UNDP, EEC and ITU for sustaining the existing structures and/or expansion.

7. ANALYSIS OF THE TELECOMMUNICATIONS DEPARTMENT'S PERSONNEL

7.1 Staffing

61. As of December 1987, UPTC has a total of 2,158 staff. The total number of UPTC staff employed exclusively for telecommunications functions is 987 or 46 per cent, and 264 or 12 per cent are solely assigned to postal services. UPTC management and common staff services comprise 907 staff members or 42 per cent. The telecommunications staff ratio is 21 per 1,000 DELs which is still below the UPTC target of 95.

62. At the request of the Government of Uganda in 1983, the World Bank conducted a study on staff appraisal of UPTC, in connection with a $22 million IDA credit to help finance a Posts and Telecommunications Rehabilitation Project. The objective was mainly aimed at urgently rehabilitating or replacing those parts of the network which were run down for lack of spare parts or damaged in the 1978/79 war, improving the standard of postal service in the country, and addressing selected areas of badly needed institutional development within the Posts and Telecommunications sectors.

63. According to the staff appraisal report, UPTC had a total of 4,071 staff in 1983. The Telecommunications Department had 2,158 or 53 per cent, and 469 or 12 per cent were in the postal sector. UPTC management and common support comprised 1,444 staff or 35 per cent.

64. In the telecommunications sector, the manpower strength had dropped in four years (1983 - 1987), from 2,158 to 987 or 46 per cent, while the rehabilitation project which has not been implemented forms part of the 1985 - 1990 development programme. This situation poses a serious drawback to the effective implementation and operation of UPTC's current development programme.

(a) Recruitment for the Telecommunications Department

65. Reliable data on recruitment was not available. However, it was confirmed that UPTC is still recruiting. Engineers trained at Makerere University are recruited after successful completion of their first degree. These engineers must undergo two years on the job training. Other engineers are usually recruited from approved universities outside the country. Depending on their

technical abilities they either under go further specialized training or are put directly to work.

66. Technicians are recruited after graduation from Uganda Technical College at Kyambogo and other technical institutions within the country and are put directly to work. For some time, some technical trainees were recruited externally. It is also possible to become a technician by internal promotion.

(b) Staff promotion and movements

67. The established system for promotions and movements is rarely followed. Staff movements take place according to the availability of staff and the needs of the service. It was stated that promotions have not taken place within the Telecommunications Department for about 10 years. The higher level posts are usually filled by appointments.

(c) Wastage level

68. Statistics on wastage level were not available, but it was said that many staff left the service for lack of motivation and incentives. In many developing telecommunication organizations, wastage may be assumed to be of the order of 3 to 5 per cent. But as indicated under staffing, UPTC has experienced a 46 per cent turnover of its staff from 1983 to 1987. This rendered UPTC unique for this period.

(d) Entry points and qualifications

69. The entry points for the Telecommunication Department of UPTC are usually at level 2 for skilled workers and level 4 for professionals. However, in recent years most of the higher level posts have been filled by direct appointments.

(e) Staff classification

70. The staff is classified in accordance with the ITU's reference level as outlined in Annex 3. The breakdown of grades and levels is as follows:

Levels	Grades
4,5,6,7	Senior Engineer and Application Engineer
4	Engineer, Controller
3	Supervisor, Senior Technician
2	Technician and Operational Technician
1	Unskilled workers

71. Using the above reference level, and an analysis of the present staff situation in the Telecommunications Department, the staff were classified as set out in Table 7.1. The staff of the department common to the postal services are not included.

7.2 Operational analysis of the staff

72. In order to impart operational and maintenance knowledge, when new telecommunications equipment such as digital switching and transmission systems, etc. are installed, the supplier provides factory and on the job training to selected teams. Basic technical skills and sometimes advanced knowledge may be required to undergo this type of training.

73. Apart from the above training which needs to be kept up, the training situation is less than adequate.

74. UPTC has eight regions, namely: Kampala, Jinja, East Mbale, North Gulu, South Mbarara, Central Entebbe, Masaka and West Fort Portal. Each region has four main areas of operation: switching, local network, transmission and energy. The switching and local networks teams are responsible for managing the exchanges, connecting subscribers and repairing faults. In the case of switching, the difficulty is to maintain an adequate level of competence on electromechanical systems.

75. With regard to maintenance, UPTC has eight maintenance zones, one for each region. The eighth one is located at Kampala Headquarters: operation and maintenance.

76. Despite the re-organization, maintenance continues to face major problems such as the supply of spare parts and insufficiently skilled staff, although in practice training can only be given in the field.

77. From the analysis of the Telecommunications Department's staff summed up in table 7.1, the operational section is grossly understaffed. Modernization of the department will certainly considerably reduce the much needed manpower at the operational level.

Table 7.1

Classification of staff

Level	Established professional Post	Skilled	Semiskilled	Unskilled
4,5,6,7	209			
3		547		
2			230	
1				1*

* All of the unskilled labourers are placed under the Personnel/Training Department but assigned by needs to various departments.

78. Since the statistics were not available, the present staff could not be broken down into the following categories. Namely: switching, local networks, transmissions and operations and classified into the levels established in table 7.1.

7.3 Human resources management and development

79. The largest share of UPTC's assets is its staff. Hence it is necessary that UPTC as a matter of urgency review its personnel policy.

80. Some of the essential qualities for proper development and utilization of human resources are: organizational rules must be explicit, precise, accepted and correctly applied, effective communications and information must flow both within and outside UPTC and a high level of staff in all categories should be maintained.

81. In operation, the staff account for a large portion of operational costs, therefore increasing importance must be paid to the development, management and utilization of all staff.

82. The Telecommunications Department must operate within the framework of an explicit corporation staff policy, i.e. recruitment and proper staff utilization. In other words a good recruitment policy for technical, management and appropriate training system should be maintained.

83. To optimize staff utilization would require constant knowledge of manpower levels in relation to useful manning of posts and at the same time ensuring that working conditions and staff motivation are satisfactory.

84. It is proposed that UPTC add a career development, unit to the Personnel and Training Department. The head of the Training Section would be responsible for implementing personnel policy, particularly with specific regard to recruitment management, promotions and movements of staff.

85. To implement this proposal would require a review of organization charts, job descriptions, and occupational groups, follow-up of staffing, recruitment, personnel and training files and manning tables summarizing useful information etc. The completion of the computerization of UPTC now in progress would be most helpful in the reorganization exercise and staffing.

86. In reviewing the policy for management development and utilization of available human resources, it is proposed that the following objectives be considered:

(a) Selection and staffing procedures;
(b) Raising the level of staff productivity;
(c) Improving staff incentives and motivation;
(d) Improving the training and manpower planning system.

8. TELECOMMUNICATIONS DEVELOPMENT PROGRAMME

8.1 Recovery and rehabilitation programme

87. The Government's sector development strategy emphasizes the rehabilitation and expansion of the telecommunications and postal services to fully utilize the existing network capacity and the strengthening of UPTC as part of the Government's programme to rehabilitate Uganda's infrastructure and institutions. In the 1982 Recovery and Rehabilitation Programme, the Government gave priority to rehabilitating networks in the major population and business centres with limited capacity expansion if justified by large demand, for improving UPTC's operating efficiency and financial position.

88. Several parts of the 1982 programme were not implemented due to lack of funds and UPTC's implementation capacity. These have been modified and included in the 1985 - 1990 Investment Programme.

8.2 1985-1990 Investment Programme

89. UPTC's 1985-1990 Investment Programme is a continuation of the 1982-1987 Recovery and Rehabilitation Programme, under which UPTC has made a good start in rehabilitating the sector. During 1982-1985 it had increased the telephone exchange capacity from 37,000 lines to 58,000 lines, by (i) installing new digital exchanges in Kampala, Masaka and Mbarara and rehabilitating the crossbar exchanges in Jinja, Entebbe, Fort Portal and three other towns, (ii) doubled the capacity of telex exchanges from 520 lines to 1,020 lines, (iii) established microwave links from Kampala to Entebbe, Mbarara and Masaka, and (iv) strengthened its institutional capabilities. In 1986, it had hoped to rehabilitate and expand a substantial number of radio systems in the rural areas, thus improving service in key agricultural regions. The foreign exchange for the Kampala digital exchanges project was provided by a French credit, for the microwave links by EEC and UNDP. The other works have been funded under the first IDA credit.

90. The major developments to be made under this programme comprise:

(a) Consolidating earlier investments;

(b) Replacing and expanding the local cable networks and subscriber facilities in Kampala and other major towns which are critical links in the network and constrain the increased use of switching and transmission capacity;

(c) Extending the microwave routes to the borders of Tanzania and Rwanda;

(d) Establishing backbone microwave and spur transmission systems linking Kampala with major cities and towns in the northe-astern and western regions of Uganda, and converting the obsolete switching systems existing in these cities and towns to DEX systems;

(e) Improving rural communications; and

(f) Expanding international telephone and telex services.

9. MANPOWER DEVELOPMENT AND TRAINING POLICY

91. The Telecommunications Department is currently in the process of reviewing its organization structure with indications of the required manpower foreseen. After final approval of the Department's proposals, it would become operational by February 1988.

9.1 Training policy

92. UPTC's training policies were revised under training circular no. 1 of 1980. The circular covered training courses intended to raise the level of technical and professional competence and to increase the efficiency of local officers. It thus dealt only with citizens of Uganda who were already in the service of the Posts and Telecommunications Corporation and new recruits. Officers on probation were not eligible for sponsorship for courses outside the P & T schools.

93. The courses covered were:

- In-service course at P & T Training School;
- In-service courses at the E.A. Universities and other institutions of learning in East Africa;
- In-service courses at the Management Institute, Arusha;
- In-service courses overseas;
- Secretarial courses;
- Correspondence and part time courses.

9.2 Training at UPTC Training School

94. The Nakawa Posts and Telecommunications Corporation Training School was established in 1968 with its main objective of ensuring the continuing availability of qualified manpower.

95. Regular training activity at the school stopped for more than two years (1983 to mid-1985). Most of the available training instructors were deployed in the field. The school has now began training with 26 training instructors and provides basic level training for new recruits for both telecommunications and postal trainees. The school also provides some refresher courses for serving officers. Special courses on new equipment and technologies are also conducted periodically.

96. The school is both residential and non-residential and has 7 classrooms and 3 laboratories (mainly for cable jointers). At present the institute has an intake capacity of 105 students per quarter of which 34 can be accommodated as residents.

97. Using 35 weeks per school year brings the total output of the institute per year to 420 students or 14,700 trainee - weeks. About seventy-five per cent of the students are trained for the telecommunications sector i.e. 315 students or 11,025 trainee weeks.

98. The minimum entry requirement is the completion of the senior secondary form 4.

99. The following 1987 courses are programmed to be offered at the training centre: digital electronics, elementary subscriber apparatus, subscriber apparatus principles, subscribers auto telex, overhead construction methods I, underground principles, underground maintenance, switching principles, transmission and radio systems. These courses are being offered at the basic level. The teaching of these courses is seriously hampered by the lack of training model test gears and tools.

100. In summary the school lacks the following:

- Methods for the selection of trainees;
- Evaluation procedure/system;
- Performance standard;
- Training programmes;
- Model test gears and tools: and
- Well-selected course materials

101. The following training equipment is presently available at the school: variety of measuring instruments, overhead projector, video, tape recorder, photocopying facilities and transparencies. The institute is very much in need of equipment.

102. The annual running cost of the school on a student - week basis for the various courses outlined above is calculated as U. shs. 310/day/student or U. Shs. 3,450,300 (US$ 57,505) per year.

103. The physical infrastructure of the school needs rehabilitation. Also the school isunderstaffed, in adequately equipped and, as a result, cannot meet UPTC's training requirements in its present condition.

9.3 Future training needs

104. To improve the training facilities, a new complex is now under construction at the location of the existing training school. When completed it will consist of 22 classrooms accommodating 16 students per classroom and 96 (48 rooms) resident students. The expected output of the new facilities is 1,408 students or 49,280 trainee-week. The project is partly being funded by IDA Credit.

105. The training programmes of the new facilities are expected to place emphasis on improving training at all levels.

9.4 Identified needs

106. The Nakawa Posts and Telecommunications Training School has a capacity for 420 students or 14,700 trainee-weeks. This capacity is adequate to provide training to meet UPTC immediate needs. But first, the following must be done;

(a) The 1980 UPTC training policies and programmes should be revised with special emphasis on manpower development in the technical areas, administration and finance;

(b) The rehabilitation and upgrading of the school to the level where it would be capable of offering medium-level training in telecommunications should be given high priority in the rehabilitation and development programme cycle. In addition to model test gears and tools, more training experts, particularly in the areas of digital transmission and switching, will be required.

(c) A bankable project for the rehabilitation of the Nakawa Training School should be designed and submitted to appropriate donors and/or international funding agencies.

10. MANPOWER PLANNING

10.1 Proposed manpower requirements

107. The proposal for re-organization of the Telecommunications Department calls for subdivision of the country into eight regions. It is further proposed that the department staff be grouped into three major sections, namely: headquarters staff, engineering staff nationwide and operations staff-nationwide.

108. The Headquarter staff will be responsible for overall operations and maintenance of the entire system and would be headed by a Director. The engineering staff will be subdivided into eight units, each under the supervision of Headquarters. Each unit will be headed by a senior Executive Engineer (SEE), responsible for daily operation of an assigned region. The operations staff would also be subdivided into eight units, each unit will be headed by a Telecommunications Controller. These staff would be dealing with marketing, operations activities, etc.

109. The proposal calls for a total manpower strength of 2,206 of which 1,369 would be technical staff. Annex 4 gives more details.

110. The total existing manpower of the Department as of 11 December 1987 is 987 of which 567 are technical staff. A careful review of the proposed technical staff would show an increase of 71 per cent and a growth rate of 24 per cent.

111. With the present training facilities, and the availability of manpower on the Uganda market, it will be extremely difficult for UPTC to increase its manpower at the proposed growth rate. Therefore, for the purpose of this survey,

the existing technical manpower would be used for the manpower demand forecasts.

112. Manpower trends are subject to three types of decisive constraints: constraints related to the development of the telecommunications service, economic constraints, and technological constraints.

113. To describe the probable manpower trends to the year 2000, two main variables will be used; productivity index and the existing telephone main line (ML) stock. At present, the Productivity Coefficient (PC) stands at over 100 around the world. Technological development has led to major gains. In several developed countrties the PC is as high as 7 compared with about 30 in certain African countries.

10.2 Performance and productivity levels

114. The performance coefficient (PC) in 1986 for all levels of staff was calculated from the existing personnel data for the Telecommunications Department and the present status of the existing facilities.

115. From the expected developments in the number of MLs, the number of employees per 1000 ML, it is possible to construct a manpower development plan taking the present situation as the point of departure bearing in mind that unskilled personnel is less and less useful to a telecommunication administration. The evolution is assumed to be linear in time.

116. The manpower requirements were calculated using the total connected telephone line 26,799 (as of 31 December 1986).

As an example:

- MLs stock in 1986 — 26,799
- Assumed growth rate in 1986 of — 3%
- MLs stock in 1987 — 27,600
- Employees per 1000 ML (1987) — 21
- Total technical employees — 567

$$PC = \frac{\text{Staff}}{\text{ML/1000}} \qquad \frac{21 \times 1000}{26799} = 0.8$$

The manpower forecast for 1987 is given by:

$$MF = \frac{PC \times ML}{1000} = \frac{0.8 \times 27600}{1000} = 22$$

The growth rate is given by: $GR = \frac{MF}{\text{Employees/1000 ML}} = \frac{22}{21} = 10$ per cent

117. The results of the total staffing of the Department are given in Annex 5. The calculation for all levels of staffing is also possible, provided the necessary data is available. Due to lack of data i.e. the breakdown of the total staffing in transmission, local network and switching were not calculated. This survey only looks at the total staffing as a group of each category and level. The summary of the group forecasts and levels is given in Annex 6. Annex 7 gives detailed results of each group and levels. An important observation of the results is that it conforms with the new proposals.

118. In the calculation, it was assumed that the PC will grow up to 1995 thereafter UPTC may wish to adopt in practice the option of manpower stability. The policy to be pursued can be determined in terms of the results achieved in this survey.

119. The policy must now be translated into practical action and, in particular, the recruitment structure described.

120. For this survey, the staff turnover rate of 3 per cent corresponds to the number of employees who leave the service for any reason (retirement, death, etc.). The rate selected reflects the practical situation in Uganda over the period in question. Age can be used for forecasting retirements which are the cause of the turnover.

121. Recruitment will be external, since internal recruitment includes internal promotion and staff movements.

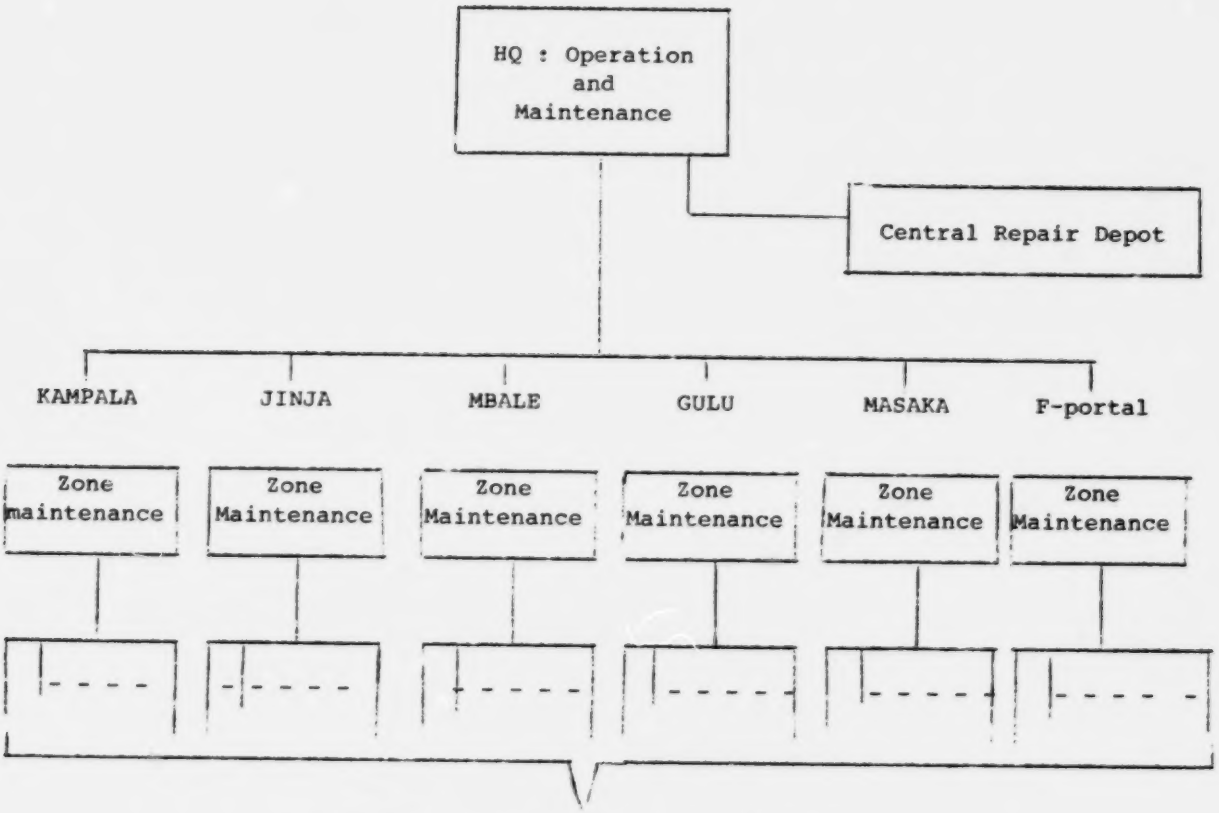
122. It is recommended that there should be no further recruitment at level 1. Even if only a few level 1 employees are capable of rising to level 2, it is desirable to foster internal promotion and promotional training in order to feed level 2. To a lesser extent this is also true for level 3.

123. The practical arrangements for the total manpower development should be defined in the light of circumstances. The assumptions made in the calculations based on 10 per cent growth rate and the variations may prove wrong, therefore, the results of this survey should be taken as a trend. They reflect developments and trends to be encouraged and do not imply specific decisions.

Annex I

Maintenance Units

KAMPALA



Organization of Ma

Annex II

EXISTING TELEPHONE EXCHANGE AND BASIC STATISTICS
31 December 1986

Zone	Exchange type	Installed switching capacity (lines)	Installed cable pairs	Lines in service	Exchange fill (%)
Kampala					
Central	E10 B dig	15,00			
	C400 Xbar	5,000			
Subtotal		20,000	21,814	10,192	51
Nsambya	E10 B Rlu	3,000	1,600	442	15
Kawemjee	EWB Rlu	,500	455	247	15
Kyambogo	C23 Xbar	1,000	1,800	400	40
Makere	E10 B	5,000	3,000*1	601	12
Mbuya	E10 B Rlu	3,000	2,000*1	443	15
Mengo	C400 Xbar	3,600	3,200	1,540	43
Bubowa	E10 B Rlu	600	100	6	6
Mukono	E10 Rlu	600	150	68	11
Bombo	Rurax	100	200	68	68
Entebbe*2	C400 Xbar	1,200	1,675	1,117	93
Manual		1,340	1,543	564	42
Subtotal		40,940	37,487	15,718	38
Jinja					
Jinja	C400 Xbar	3,000	3,900	2,380	79
Kakira	C23 Xbar	100	15	65	65
Lugazi	C23 Xbar	100	115	87	87
Manual		1,410	1,386	894-	63
Subtotal		4,610	5,516	3,426	71

Zone	Exchange type	Installed switching capacity (lines)	Installed cable pairs	Lines in service	Exchange fill (%)
Mbale					
Mbale	Strowger	800	800	661	83
Mbale	C23 Xbar	1,000	1,000	651	65
Tororo	Rurax	350	900	350	100
Manual		1,645	2,310	986	60
Subtotal		3,795	5,010	2,648	68
Masaka					
Masaka	HDX10 dig.	2,000	1,200	450	23
Mbarara*3	HDX10 dig.	2,000	1,800	352	18
Manual		1,170	1,390	739	63
Subtotal		5,170	4,390	1,541	30
Fort Portal					
Fort Portal	C23 Xbar	600	600	460	77
Manual		1,500	1,795	918	61
Subtotal		2,100	2,395	1,378	66
Gulu					
Manual		1,100	2,385	849	77
Grand total		57,715	57,183	26,799	44
Auto		86%		81%	
Manual		14%		19%	

Notes: *1: Estimated
*2: Entebbe exchange capacity to be augmented by 2,000 lines using rehabilitated

*3: Installed but not yet commissioned.

Basic statistics of telephone service, 1975-1985

December 31	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985*
Number of exchanges	97	105	121	124	103	105	112	118	118	119	121
Capacity (lines)	31,156	33,976	38,175	38,405	36,375	36,480	36,440	36,790	36,966	37,096	57,720
of which automatic (%)	77	78	77	77	77	77	77	77	77	77	84
Connected lines	20,115	19,980	21,058	22,651	19,592	20,626	20,479	22,962	24,067	24,971	26,200
Exchange occupation (%)	65	59	55	59	54	57	56	62	65	67	45
Telephones	45,001	46,106	48,884	52,183	46,359	45,892	43,424	52,762	54,439	55,820	58,500
Outstanding applications	13,340	16,125	18,042	13,561	13,467	15,289	21,233	21,922	19,678	20,200	23,100

Note: * : Estimated by YUPTC on the basis of mid-year data

Source: UPTC, 1986.

Annex III

Reference levels for Telecommunications Training

LEVEL 7 JOB

Examples:
Director General of Telecommunications
Director of Telecommunications
Head of Department of Posts and Telecommunications
General Manager

Description:
Senior responsible government or administration officials or leaders of private industry involved in policy-making and management at the highest level.

LEVEL 6 JOB

Examples:
Director
Assistant Director
Chief Engineer
Head of Service

Description:
Senior telecommunication officials empowered to take decisions and responsible for a budget, operational planning etc.

Analyses situations and takes decisions on the planning, co-ordination, control, organization and management of the department of service for which he is responsible, with the collaboration of his immediate subordinates who are generally at level 5.

LEVEL 5 JOB

Examples:
Engineer
Chief supervising technician
Manager, Head of Centre
Engineer in charge of a laboratory
Specialized research worker

Description:
1. Is responsible for a service, project or telecommunication section. Plans, co-ordinates, manages and supervises the service/section/project for which he is responsible. Manages his service/section/project in collaboration with his immediate associates, who are generally at level 4, or

2. Carries out scientific or technological research in a specialized field.

LEVEL 4 JOB

Examples: Supervising technician, Foreman
Senior technician
Inspector
Chief of Section

Description: Staff of level 4 are mostly direct associates of senior and level 5 personnel. They have two kinds of responsibility.

1. Directing and managing local operational services, with responsibility for staff at levels 3, 2 and 1.

2. Devising creative and imaginative solutions for technical and administrative problems.

LEVEL 3 JOB

Examples: Maintenance technician
Operating technician
Skilled technician
Fitter
Accountant
Administrative officer

Description: They mostly specialize either in a particular type of equipment or in one of the branches of telecommunications (switching, transmission, lines and networks, accounting etc.), according to the organizational system of the administration/enterprise to which they belong.

These are skilled technical workers, generally capable of solving all technical problems in their specialized range of activity. They are able to take technical decisions.

LEVEL 2 JOB

Examples: Assistant technician
Technical assistant
Semi-skilled worker
Operating technician
Administrative assistant
Operator

Description: They generally work under the technical supervision of staff at level 3. They usually specialize in one of the branches of telecommunications (switching, transmission, etc.) and sometimes in a particular type of equipment.

They are generally assigned technical tasks involving simple procedures or assist staff at level 3 with more comples tasks. They generally do not take any decisions in the course of their work.

LEVEL 1 JOB

Examples:

Unskilled worker
Labourer
Driver
Messenger

Description:

They have no specialized knowledge or skills and can generally be recruited without previous training.

Annex IV

PROPOSALS FOR IMPROVING THE TELECOMMUNICATIONS DEPARTMENT

Proposed Manpower Development

The below staff is derived from the proposed re-organization and staffing of the department.

1. Headquarter staff - Operations & Maintenance

- Operations and maintenance	20
- Regional telecomms services	5
- International services	147
- Switching	57
- Power and airconditioning	34
- Transmission	37
- Telecomms planing and construction	4
Sub total staff	304

2. Engineering staff - Nationwide

- Operations and maintenance	136
- RTM/Kampala	351 (+3)
- RTM/Central Entebbe	63 (+3)
- RTM/Jinja	83 (+3)
- RTM/Masaka	64 (+3)
- RTM/South Mbarara	84 (+3)
- RTM/North Gulu	94 (+3)
- RTM/West Fort Portal	90 (+3)
- RTM/East (Mbale)	100 (+3)
Sub total	1065 (+24)1/

3. Operations staff - Nationwide (non-technical)

- RTM/Kampala	189
- RTM/Central Entebbe	151
- RTM/East	132
- RTM/Jinja	85
- RTM/North	55
- RTM/Masaka	63
- RTM/South (Mbarara)	54
- RTM/West Fort Portal	84
Sub total	813

1/ General services staff

Proposed manpower total	2206
Proposed total technical staff	1369

Existing manpower (as of 11 December 1987

1. Engineering	518
2. Operations	420
3. Planning	49
Total manpower	987
Total technical manpower	567

Proposed increase in technical manpower 71%

Demand is	1369
Existing	567
Growth Rate	24%

Source: UPTC proposed re-organization charts 1987
Source: UPTC Computer Printout 11 December 1987.

Annex V

MANPOWER PLANNING FORECASTS

This figure assumed that no increase in productivity is planned.

Planning period: 1986-1996
Indicator used: Telephone
Turnover rate: 3 per cent
Staff title: Engineering staff

Year	Unit	Index	Demand	Supply	Recruit
1987	27,600	49	22	22	0
1988	30,360	49	24	22	2
1989	33,396	49	27	24	3
1990	36,736	49	29	27	2
1991	40,410	49	32	29	3
1992	44,451	49	36	32	4
1993	48,896	49	39	36	3
1994	53,786	49	43	39	4
1995	59,165	49	47	43	4
1996	65,082	49	52	47	5
1997	71,590	49	57	52	5
1998	78,749	49	63	57	6
1999	86,624	49	69	63	6

Annex VI

MANPOWER PLANNING FORECASTS: TOTAL BREAK DOWN OF MANPOWER PER LEVELS

Year Levels	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
4,5,6,7	209	21	24	27	28	32	34	39	41	47	50	56	62
3	547	55	61	67	74	81	89	97	107	119	130	143	157
2	230	24	26	29	32	34	39	42	46	51	56	61	68
1	-	-	-	-	-	-	-	-	-	-	-	-	-
Recruit Total	-	100	111	123	134	147	162	178	194	217	236	260	287
Total Staff	987	1087	1196	1319	1453	1600	1762	1940	2134	2351	2587	2847	3134

Annex VII

MANPOWER PLANNING FORECASTS: BREAKDOWN OF MANPOWER PER LEVEL

Unit: Telephone

Index: Telephone per levels

Staff title: Professionals: Group levels: 4,5,6,7

Year	Unit	Index	Demand	Supply	Recruit
1987	27,600	132	215	209	6
1988	30,360	132	236	215	21
1989	33,396	132	260	236	24
1990	36,736	132	287	260	27
1991	40,410	132	315	287	28
1992	44,451	132	347	315	32
1993	48,896	132	381	347	34
1994	53,786	132	420	381	39
1995	59,165	132	461	420	41
1996	65,082	132	508	461	47
1997	71,590	132	558	508	50
1998	78,749	132	614	558	56
1999	86,624	132	676	614	62

MANPOWER PLANNING FORECASTS: BREAK DOWN OF MANPOWER PER LEVEL

Unit: Telephone

Index: Telephone per levels

Staff title: Group: Level 3

Year	Unit	Index	Demand	supply	Recruit
1987	27,600	50	552	547	5
1988	30,360	50	607	552	55
1989	33,396	50	668	607	61
1990	36,736	50	734	668	67
1991	40,410	50	808	734	74
1992	44,451	50	889	809	81
1993	48,896	50	978	889	89
1994	53,786	50	1076	978	97
1995	59,165	50	1183	1076	107
1996	65,082	50	1302	1183	119
1997	71,590	50	1432	1302	130
1998	78,749	50	1575	1432	143
1999	86,624	50	1732	1575	157

MANPOWER PLANNING FORECASTS: BREAK DOWN OF MANPOWER PER LEVEL

Unit: Telephone

Index: Telephone per levels

Staff title: Group: Level 2

Year	Unit	Index	Demand	Supply	Recruit
1987	27,600	110	237	230	7
1988	33,396	110	261	237	24
1989	33,396	110	287	261	26
1990	36,736	110	316	287	29
1991	40,410	110	348	316	32
1992	44,451	110	382	348	34
1993	48,896	110	421	382	39
1994	53,786	110	463	421	42
1995	59,165	110	509	463	46
1996	65,082	110	560	509	51
1997	71,590	110	616	560	56
1998	78,749	110	677	616	61
1999	86,624	110	745	677	68
					515